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(71) 出願人 000237020

ポリマテック株式会社

東京都中央区日本橋本町4丁目8番16号

(72) 発明者 榎野 正幸

埼玉県岩槻市表慈恩寺978-1 テクニカル  
センター

(74) 代理人 100071098

弁理士 松田 省躬

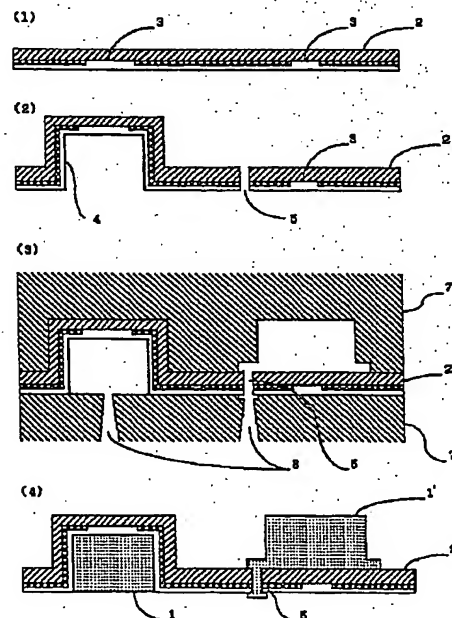
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(54) 【発明の名称】 フィルム一体複合キーシートの製造方法

(57) 【要約】

【課題】 樹脂フィルムの表裏面の樹脂釦が1回の射出成形で容易に形成でき、かつ表示部も1回の印刷で容易に形成できるフィルム一体複合キーシートの製造方法

【解決手段】 少なくとも一つの樹脂釦が、樹脂釦の上面側と同形状に湾曲した樹脂フィルムの湾曲凹部内に形成され、さらに少なくとも一つの樹脂釦が、表示部の周囲の位置に設けた孔を貫通して樹脂フィルムの表示部の上方を覆うように形成される



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## 【特許請求の範囲】

【請求項1】 樹脂フィルムの所定の位置に上方に湾曲状に絞り加工して湾曲凹部を形成し、また樹脂フィルムの別の所定の位置に少なくとも一つの孔を形成し、この孔と樹脂注入ゲートを整合し、樹脂フィルムを射出成形の金型にて挟持し、樹脂を流し込み、樹脂フィルムの表裏面の樹脂釦を1回の射出成形で容易に形成できるフィルム一体複合キーシートの製造方法

【請求項2】 樹脂フィルムに表示部が形成され、少なくとも一つの樹脂釦が、前記表示部の位置に形成した樹脂釦の上面側と同形状に湾曲した樹脂フィルムの湾曲凹部内に樹脂を注入して形成され、他方、少なくとも一つの樹脂釦が、表示部の周囲の位置に設けた少なくとも一つの孔より樹脂を注入して樹脂フィルムの表示部の上方を覆うように形成されるフィルム一体複合キーシートの製造方法

【請求項3】 表示部が、樹脂フィルムの裏面に形成されていることを特徴とする請求項2に記載のフィルム一体複合キーシートの製造方法

【請求項4】 注入樹脂がポリカーボネート樹脂、樹脂フィルムもポリカーボネート樹脂からなることを特徴とする請求項1、請求項2または請求項3に記載のフィルム一体複合キーシートの製造方法

## 【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、電話機、移動体通信機器、音響機器、テレビ、ビデオ、ファクシミリ、コピー機及び車載用機器等の入力部に組み込まれる押釦スイッチのフィルム一体キーシートの製造方法に関するものである。

【0002】

【従来の技術】近年の電気、電子機器の小型化、携帯化にともない、その操作部に用いる押釦スイッチにおいても小型化、薄型化、軽量化が要望されており、複数の薄い樹脂釦を樹脂フィルムで一体化したフィルム一体キーシートの需要が多くなってきている。

【0003】従来から非常に多く用いられているフィルム一体キーシートは、樹脂釦の上面側と同形状に湾曲した樹脂フィルムが樹脂釦の上面側と一体化したフィルム一体キーシートの構成であり、その製造方法は、表示部等を裏面に印刷した樹脂フィルムを樹脂釦の上面側と同形状に湾曲に絞り、その湾曲凹部内に溶融した樹脂を射出することによって一体化し製造していた。このフィルム一体キーシートの表示部は、樹脂釦の表面と樹脂フィルムの裏面との間に介在しているため、見易く、また摩擦により消えることがなかった。

【0004】また、薄い樹脂釦の裏面に表示部を設けたフィルム一体キーシートのデザインの要望が多くなってきている。この要望に応えるものとして、予め成形した透明または半透明の樹脂釦の裏面に表示部を設け、その

樹脂釦を樹脂フィルムに接着剤や粘着テープを用いて張り合わせたフィルム一体キーシートが知られている。

【0005】新たなデザインとして、樹脂フィルムの裏面側に樹脂釦がある前者と樹脂フィルムの表面側に樹脂釦がある後者とを一体化したフィルム一体複合キーシートが要求されてきた。

【0006】

【発明が解決しようとする課題】従来のフィルム一体複合キーシートの製造方法は、図4に示すように、先ず表示部13等を裏面に印刷した樹脂フィルム12の一部を樹脂釦11の上面側と同形状に湾曲に絞り、その湾曲凹部14内に溶融した樹脂を射出することによって第1のフィルム一体化キーシートを製作し、次に裏面に表示部13を設けた透明または半透明の樹脂釦21を同一樹脂フィルム12の所望の位置に接着剤や粘着テープ16を用いて貼り合わせ、フィルム一体複合キーシートを製造していた。これでは、部品数が多く、貼り合わせの手間が掛かり、コストも高いものとなった。

【0007】

【課題を解決するための手段】本発明は、上記の課題を解決するもので、樹脂フィルムの表裏面の樹脂釦が1回の射出成形で容易に形成でき、かつ表示部も1回の印刷で容易に形成できるフィルム一体複合キーシートの製造方法を提供するものである。

【0008】すなわち、複数の樹脂釦が表示部を有する一枚の樹脂フィルムに配置されているフィルム一体シートにおいて、少なくとも一つの樹脂釦が、樹脂釦の上面側と同形状に湾曲した樹脂フィルムの湾曲凹部内に形成され、さらに少なくとも一つの樹脂釦が、表示部の周囲の位置に設けた孔を貫通して樹脂フィルムの表示部の上方を覆うように形成されるフィルム一体複合キーシートの製造方法である。さらに、表示部が、樹脂フィルムの裏面に形成されるフィルム一体複合キーシートの製造方法である。さらに、樹脂釦がポリカーボネート樹脂からなる釦で、樹脂フィルムがポリカーボネート樹脂からなるフィルムであるフィルム一体複合キーシートの製造方法である。

【0009】

【発明の実施の形態】以下に、本発明を図を用いて詳細に説明する。本発明の代表的な製造工程は、図1に示すように、樹脂フィルム2の上面もしくは下面に、文字記号等の表示部3を形成し(1)、その樹脂フィルムの所定の位置に治具又は金型にて上方に湾曲状に絞り加工して湾曲凹部4を形成し、また樹脂フィルムの別の所定の位置に孔5を加工する(2)。その後、その樹脂フィルム2を射出成形の金型7にて挟持し(3)、樹脂を注入ゲート8より流し込む。樹脂フィルム2の表裏面の樹脂釦1,1'が1回の射出成形で容易に形成でき、かつ表示部3も1回の印刷で容易に形成できたフィルム一体複合キーシートを製造することができた。

【0010】本発明の別な実施の形態は、図2に示すように、樹脂フィルム2の裏面に表示部3が形成され、少なくとも一つの樹脂釦1が、樹脂釦の上面側と同形状に湾曲した樹脂フィルム2の湾曲凹部4内に樹脂を注入して形成され、他方少なくとも一つの樹脂釦1'が、表示部の周囲の位置に設けた2箇所の孔5、5'より樹脂を注入して樹脂フィルムの表示部3の上方を覆うように形成されるフィルム一体複合キーシートの製造方法である。

【0011】なお、図3に示すように、樹脂フィルム2'にポリカーボネート樹脂を使用することにより、樹脂釦21の射出成形の際に樹脂釦21と樹脂フィルム2'が溶着するために、表示部の周囲の位置に設けた孔5内を樹脂釦の一部が貫通しない構成のフィルム一体化複合シートが具現化できる。

【0012】

【実施例】図4に実施例を示す。ポリカーボネート樹脂からなる樹脂フィルム2'の下面に、表示部13として記号を印刷し、その樹脂フィルムの一部を金型7にて上方に湾曲状に絞り加工し、また所望の位置にφ0.5mm程度の孔5を加工した。その後、その樹脂フィルム2'を射出成形の金型7に挟持し、ポリカーボネート樹脂を注入ゲート8より流し込んだ。樹脂フィルム2'の表裏面の樹脂釦11、21が1回の射出成形で容易に形成でき、かつ表示部13も1回の印刷で容易に形成できたフィルム一体複合キーシートを製造することができた。

\*【0013】

【発明の効果】本発明は、樹脂釦を樹脂フィルムの表面側および裏面側にそれぞれ容易に設けることが可能となり、且つフィルムにて樹脂釦を連結させることにより、キーシートの薄型化を可能としたフィルム一体複合キーシートを提供できるものである。

【0014】表裏面の樹脂釦を夫々切断することなく、また、表示部の印刷も平坦な樹脂フィルムへ直接印刷することができるため、製造歩留りの向上および製造コストの低減等、フィルム一体複合キーシートが容易に製造でき、製品仕様もデザインバリエーションの拡大が可能となった。

【図面の簡単な説明】

【図1】本発明の製造工程の縦断面図

【図2】本発明の別な実施の形態の縦断面図

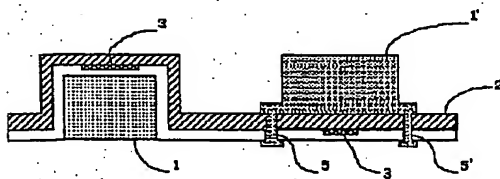
【図3】本発明の別な実施の形態の一製造工程の縦断面図

【図4】従来のフィルム一体キーシートの縦断面図

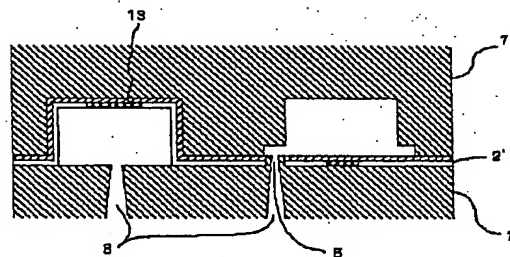
【符号の説明】

- 1、1'、11、21 樹脂釦
- 2、2'、12 樹脂フィルム
- 3、13 表示部
- 4 湾曲凹部
- 5、5' 孔
- 7 金型
- 8 注入ゲート
- 16 接着剤

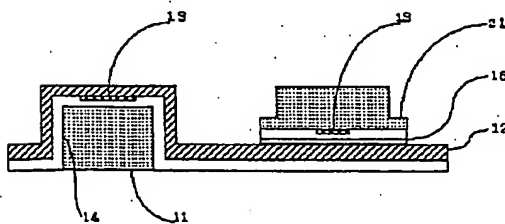
【図2】



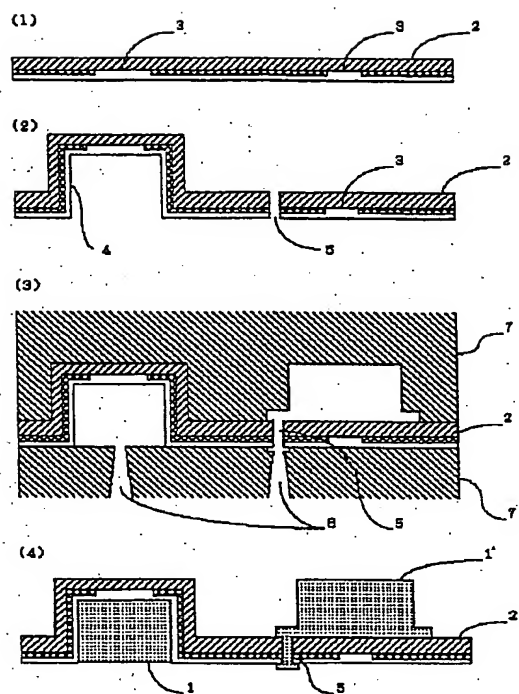
【図3】



【図4】



【図1】



## PATENT ABSTRACTS OF JAPAN

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(71)Applicant : POLYMATECH CO LTD

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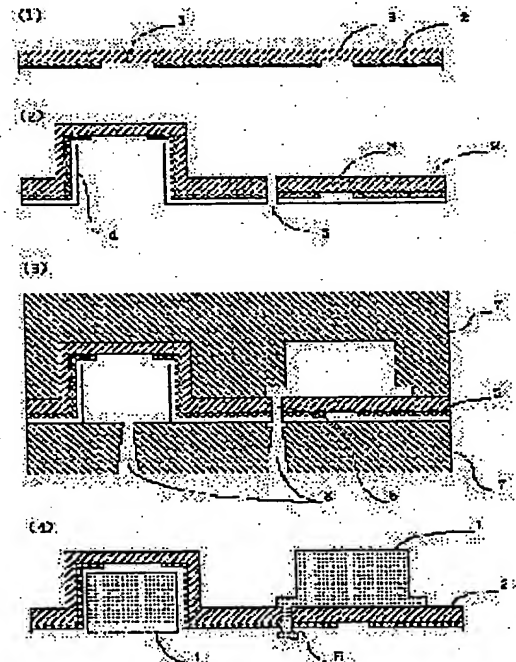
(72)Inventor : KASHINO MASAYUKI

## (54) METHOD OF MANUFACTURING FILM INTEGRATED-LAMINATED COMPOSITE KEY SHEET

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a method of manufacturing a film integrated laminated key sheet capable of easily forming resin buttons on front and rear faces of a resin film by single injection molding, and easily forming a display part by single printing.

**SOLUTION:** At least one resin button is formed in a curved recessed part of the resin film curved into the same shape as an upper face side of the resin button, and further at least one resin button is formed in a state of covering an upper part of a display part of the resin film through a hole formed on a position around the display part.



## LEGAL STATUS

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[Patent number]

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**CLAIMS**

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[Claim(s)]

[Claim 1] It is really [ film ] which carries out spinning to the letter of a curve in the upper part at the position of a resin film, and forms a curve crevice, and forms at least one hole in another position of a resin film, adjusts this hole and the resin pouring gate, pinches a resin film with the metal mold of injection molding, slushes a resin, and can form easily \*\*\*\*\* on the rear face of front of a resin film with 1 time of injection molding the manufacture method of a compound key seat. [Claim 2] A display is formed in a resin film, and in the curve crevice of the resin film which curved in the shape of isomorphism the upper surface side of \*\*\*\*\* formed in the position of the aforementioned display, at least one \*\*\*\*\* pours in a resin and is formed. On the other hand, it is really [ film ] which is formed so that at least one \*\*\*\*\* may pour in a resin and may cover the upper part of the display of a resin film from at least one hole prepared in the position around a display the manufacture method of a compound key seat. [Claim 3] The manufacture method of a film one compound key seat according to claim 2 that a display is characterized by being formed in the rear face of a resin film. [Claim 4] The claim 1 to which a pouring resin is characterized also for polycarbonate resin and a resin film by the bird clapper from polycarbonate resin, the manufacture method of a film one compound key seat according to claim 2 or 3.

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[Translation done.]

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention really [ of the push button switch built into the input sections, such as telephone, mobile communication equipment, an audio equipment, television, video, facsimile, a copy machine, and ambulance or vehicle equipment, / film ] relates to the manufacture method of a key seat.

[0002]

[Description of the Prior Art] Also in the push button switch used for the control unit, a miniaturization, thin-shape-izing, and lightweight-ization are demanded with the electrical and electric equipment in recent years, the miniaturization of electronic equipment, and carrying-izing, and the need of a key seat is really [ film ] which made two or more thin \*\*\*\*\* one with the resin film increasing.

[0003] Really [ film ] which is used from the former a key seat The resin film which curved in the shape of isomorphism the upper surface side of \*\*\*\*\* is really [ film ] which was united the upper surface side of \*\*\*\*\* the composition of a key seat. the manufacture method The resin film which printed the display etc. at the rear face was extracted to the curve in the shape of isomorphism the upper surface side of \*\*\*\*\* and it was unifying and manufacturing by injecting the resin fused in the curve crevice. Really [ this / film ], since the display of a key seat intervened between the front face of \*\*\*\*\* and the rear face of a resin film, it was legible and did not disappear by wear.

[0004] Moreover, the request of the design of a key seat is really [ film ] which prepared the display in the rear face of thin \*\*\*\*\* increasing. As what meets this request, a display is prepared in the rear face of transparent or translucent \*\*\*\*\* fabricated beforehand, and the key seat is really [ film ] which adhesives and the adhesive tape were used [ really ] and made the \*\*\*\*\* rival on a resin film known.

[0005] The compound key seat has really [ film ] which made one the former which has \*\*\*\*\* in the rear-face side of a resin film, and the latter which has \*\*\*\*\* in the front-face side of a resin film as a new design been required.

[0006]

[Problem(s) to be Solved by the Invention] Really [ conventional / film ] the manufacture method of a compound key seat As shown in drawing 4 , some resin films 12 which printed the display 13 grade at the rear face first are extracted to a curve in the shape of isomorphism the upper surface side of \*\*\*\*\* 11. The 1st film unification key seat is manufactured by injecting the resin fused in the curve crevice 14. Next, adhesives and the adhesive tape 16 were used for the position of a request of



transparent or translucent \*\*\*\*\* 21 which formed the display 13 in the rear face of the same resin film 12, and the compound key seat was lamination and really [ film ] manufactured. Now, there were many parts, the time and effort of lamination was taken, and cost also became high.

[0007]

[Means for Solving the Problem] this invention solves the above-mentioned technical problem, and really [ film ] which \*\*\*\*\* on the rear face of front of a resin film can form easily with 1 time of injection molding, and can also form a display easily by one printing offers the manufacture method of a compound key seat.

[0008] Namely, it really [ film ] which is arranged at the resin film of one sheet with which two or more \*\*\*\*\* have a display sets on a sheet. At least one \*\*\*\*\* is formed in the curve crevice of the resin film which curved in the shape of isomorphism the upper surface side of \*\*\*\*\*. It is really [ film ] which is furthermore formed so that at least one \*\*\*\*\* may penetrate the hole prepared in the position around a display and the upper part of the display of a resin film may be covered the manufacture method of a compound key seat. Furthermore, a display is really [ film ] which is formed in the rear face of a resin film the manufacture method of a compound key seat. Furthermore, it is really [ film ] which is \*\* which \*\*\*\*\* turns into from polycarbonate resin, and is the film with which a resin film consists of polycarbonate resin the manufacture method of a compound key seat.

[0009]

[Embodiments of the Invention] Drawing is used for below and this invention is explained to it in detail. As shown in drawing 1, the typical manufacturing process of this invention forms the displays 3, such as a letter symbol, in the upper surface or the inferior surface of tongue of the resin film 2, spinning of it is carried out to the letter of a curve with a fixture or metal mold in the upper part at the position of (1) and its resin film, and it forms the curve crevice 4, and processes a hole 5 into another position of a resin film (2). Then, the resin film 2 is pinched with the metal mold 7 of injection molding, and (3) and a resin are slushed from the pouring gate 8. The compound key seat was really [ film ] which \*\*\*\*\* 1 on the rear face of front of the resin film 2 and 1' could form easily with 1 time of injection molding, and has also formed the display 3 easily by one printing able to be manufactured.

[0010] A display 3 is formed in the rear face of the resin film 2 as the form of another operation of this invention is shown in drawing 2. In the curve crevice 4 of the resin film 2 which curved in the shape of isomorphism the upper surface side of \*\*\*\*\* , at least one \*\*\*\*\* 1 pours in a resin, and is formed. another side — two holes 5 and 5

which one \*\*\*\*\* 1' prepared in the position around a display even if few — ' — a resin — pouring in — the upper part of the display 3 of a resin film — a wrap — it is really [ film ] which is formed like the manufacture method of a compound key seat [0011] In addition, since \*\*\*\*\* 21 and resin film 2' weld by using polycarbonate resin for resin film 2' in the case of injection molding of \*\*\*\*\* 21 as shown in drawing 3, the film unification compound sheet of composition of that a part of \*\*\*\*\* does not penetrate the inside of the hole 5 prepared in the position around a display can be embodied.

[0012]

[Example] An example is shown in drawing 4. The sign was printed as a display 13, and spinning of a part of the resin film was carried out to the letter of a curve with metal mold 7 in the upper part, and the about [  $\phi 0.5\text{mm}$  ] hole 5 was processed into the desired position on the undersurface of resin film 2' which consists of polycarbonate resin. Then, the resin film 2' was pinched to the metal mold 7 of injection molding, and polycarbonate resin was slushed from the pouring gate 8. The compound key seat was really [ film ] which \*\*\*\*\* 11 and 21 on the rear face of front of resin film 2' could form easily with 1 time of injection molding, and has also formed the display 13 easily by one printing able to be manufactured.

[0013]

[Effect of the Invention] A compound key seat can really [ film ] which enabled thin shape-ization of a key seat be offered by this invention's becoming possible [ preparing \*\*\*\*\* in a front-face / of a resin film /, and rear-face side easily, respectively ], and making \*\*\*\*\* connect with a film.

[0014] Since printing of a display was also directly printed to a flat resin film, without cutting \*\*\*\*\* on the rear face of front, respectively, really [ film ], the compound key seat could manufacture easily the improvement in the manufacture yield, reduction of a manufacturing cost, etc., and it became possible also for product specification to expand [ of a design variation ] them.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] Drawing of longitudinal section of the manufacturing process of this invention

[Drawing 2] Drawing of longitudinal section of the gestalt of another operation of this invention

[Drawing 3] Drawing of longitudinal section of one manufacturing process of the gestalt of another operation of this invention

[Drawing 4] It is really [ conventional / film ] drawing of longitudinal section of a key seat.

[Description of Notations]

11 1, 1', 21 \*\*\*\*\*

2, 2', 12 Resin film

3 13 Display

4 Curve Crevice

5 5' Hole

7 Metal Mold

8 Pouring Gate

16 Adhesives

**\* NOTICES \***

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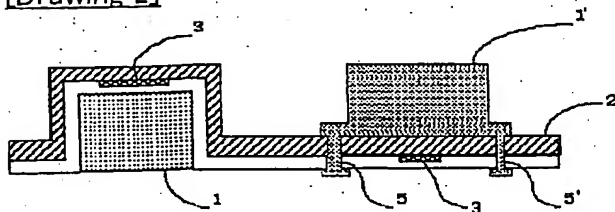
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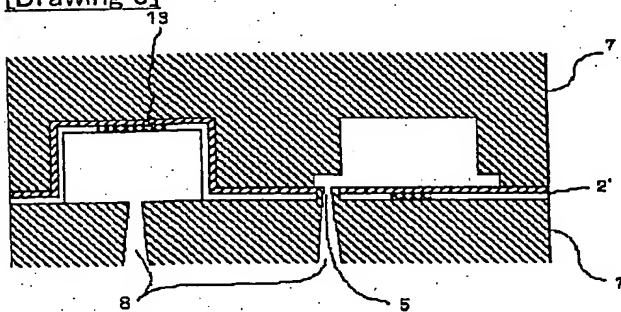
**DRAWINGS**

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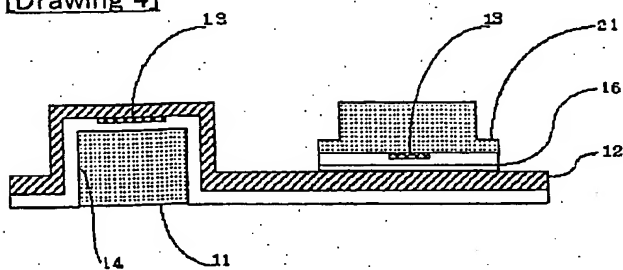
**[Drawing 2]**



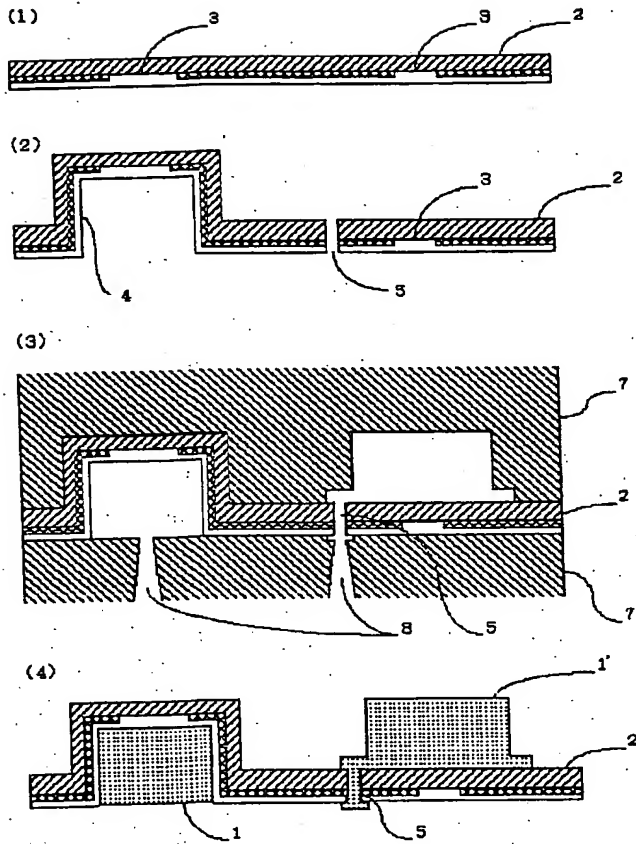
**[Drawing 3]**



**[Drawing 4]**



**[Drawing 1]**



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[Translation done.]